Comparison of Kubernetes Operators for MySQL

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@bagder

Planets

curl://

Earth

2

Mars

Planets known to have run curl



Microsoft
Microsoft Windows 95

DVD TM

Pay

MySQL
164k commits (since 2008)
#1 database

Kubernetes
100k commits
#1 for containers

MySQL

Kubernetes

2018

1995

2014

2021

operator-sdk



Why Operators

- **Customer driven decision**
- **Containers = Kubernetes**
  - Bare metal -> VM -> Containers
- **Operators = Simplification**
  - Automate deployment and management
- **Percona DBaaS**
  - Cloud and on-prem
  - Open source



MariaDB Operator



- Closed source
- After SkySQL release, every mention was removed from mariadb.com
- Used as an engine for SkySQL
- There is an unofficial MariaDB operator, no active dev



Oracle Operator



- **Old Operator - dead — latest release — 0.3.0**
- **On Percona Live 2021 announced new Operator**
  - Beta release in June 2021
  - Group replication
  - Open Source (Universal Permissive License (UPL))
  - C++ and Python (around mysql-shell)



KubeDB Operator



- **Swiss Army Knife, supports: Elasticsearch, Redis, Memcached, MongoDB, PostgreSQL, and MySQL**
- **The latest release — 0.18.0 (Apr 2021)**
- **MySQL version — 5.7.33, 8.0.23**
  - Supports Group Replication
- **Open source (open core)**
- **Supports Percona XtraDB Cluster, 5.7 only**



KubeDB Operator, cont.

Limitations:

- **Limited features in community edition**
  - No proxying
  - No backup/restore
  - No scaling
  - No encryption
- **No proxy integration**



Presslabs Operator



- The latest release — 0.4.0 (Jun 2020)
- Percona Server for MySQL - 5.7.26 (Apr 2019)
- Open source
- Alpha state
- By default — regular asynchronous replication, semi-synchronous replication can be enabled.
- High Availability reached with Openark Orchestrator
- MySQL 8.0 is on the Roadmap



Presslabs Operator, architecture

Client Application

Read / Write

Read

Master SRV

Nodes SRV

Read / Write

Read

Read

Read

Orchestrator

DB Pod 1

DB Pod 2

DB Pod 3

Asynchronous Replication



Vitess Operator



- The latest release — 2.4.0 (Apr 2020)
- Supports Percona Server for MySQL
- Open source
- General availability state
- By default — semi-synchronous replication, regular asynchronous replication can be enabled
- Solution is targeted for Sharding — One Shard mode is possible
- High Availability reached internally



Percona Operator



- The latest release — 1.8.0 (April 2021)
- Percona XtraDB Cluster version — 8.0.22, 5.7.33
- Open source
- General Availability state
- Galera Replication (multi-master)
- High Availability with HAProxy/ProxySQL



Percona Operator

Client Application

Read Write

ProxySQL

Read Write

Read Write

Read Write

PXC Pod 1

PXC Pod 2

PXC Pod 3

Galera Replication



Proxying	☀️	☁️	☀️	$
Multi-Region	☁️	🌤️	☀️	☁️
Monitoring	☀️	🌤️	☀️	🌤️
Encryption at Rest	☀️	☁️	☁️	$
MySQL 8.0	☀️	☁️	☀️	☀️
Simplicity	🌤️	☀️	☁️	🌤️



Pick the Operator

Sharding?

- Yes → (logo)
- No → Ok to lose few transactions?
  - Yes → (logo)
  - No → Free?
    - Yes → (logo)
    - No → (logo)



What is coming

- **Disaster Recovery / Multi-region**
- **New Operator (or v2)**
  - Percona Server for MySQL vs PXC
  - Async replication
  - Group replication
  - Sharding



Thanks!



Any questions?

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